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ACCLIMATISATION: ITS EMINENT ADAPTATION TO AUSTRALIA.

A L E C T U R E

DELIVERED IN SYDNEY,

BY

DR. GEORGE BENNETT, F.R.S., &c. &c.

Republished by the Acclimatisation Society of Victoria.

“There is nothing in the world really beneficial that does not lie within the reach of an informed understanding, and a well-directed pursuit”—BURKE.

MELBOURNE :

WM. GOODHUGH & CO., PRINTERS, 48 FLINDERS LANE EAST.

MDCCLXII.

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LECTURE ON ACCLIMATISATION.

THE subject on which I have the honour of addressing you this evening is one now exciting great interest in Europe, and is becoming of great importance: it is the acclimatisation or art of introducing the mammalia, birds, fishes, and insects into countries to which they are foreign, utilising them in places where they were formerly unknown, and in such congenial localities as may conduce to their being reared and propagated with success—thus reducing our scientific knowledge to useful and practical purposes.

This art, from its value to mankind generally, is at the present time making rapid progress in Europe, and through the great exertions of Mr. Edward Wilson is firmly established at Melbourne, and extending to other British colonies.

That the subject of Acclimatisation is not of recent origin is proved by reference to the works of Lord Bacon, upwards of 250 years since, who, in his "*New Atlantis*," in an edition in my possession, of 1627 (p. 35), shadows it forth in these words—“We have also parks, and enclosures of all sorts of beasts and birds, which we use not only for view or rareness, but likewise for dissections and trialls. That thereby we may take light, what may be wrought upon the body of man.”—“We try also poysons and other medicines upon them, as well as of chyrurgery, and physick.” “We have also particular pools, where we make trialls upon fishes, as we have said before of beasts and birds.” “We have also places for breed and generation of those kindes of worms and flies which are of special use, such are with you your silkworms and bees.”

A few weeks since a meeting was held in this city, and a provisional committee appointed to prepare and bring this important subject before the public at a general meeting; and when that time arrives I hope it will meet with the success it deserves. Already the provisional committee have had a very liberal offer from Mr. Holt, of Newtown, of his valuable grounds (under certain conditions), situated at Cook's River, consisting of about 120 acres, enclosed by a wall six feet in height, and with all the buildings and improvements upon it, at a mere nominal rental of five shillings annually. The grounds combine shelter, pasturage, water, and all the capabilities requisite for the purposes of acclimatisation; and Mr. Holt has already expended, and is still expending, large sums upon this property, the whole of which he places at the disposal of the society. Such a liberal offer is rarely to be met with from a private individual, and will, no doubt, be highly appreciated by the public, for whose benefit it is intended.

In 1854, a society for the purpose of acclimatisation was established in Paris, and its influence was soon felt; for in 1855 a report was made, from which it appeared there had arisen, in other parts of France, a desire of forming similar institutions, which were to be affiliated to the parent stem. In 1858, by the concurrence of the Imperial Government, and of the municipality of the city of Paris, a large extent of ground was placed at the disposal of the society, was in progress of arrangement during my visits to Paris in 1859 and 1860, and has since been completed and opened to the public.

On the first establishment of the Zoological Society of London, its objects were those of the present acclimatisation societies, and was never intended by its founders as merely a menagerie of wild animals. It was instituted in 1826, under the auspices of Sir Humphrey Davy and Sir Stamford Raffles, and other eminent men, "for the advancement of zoology, and the introduction, exhibition, and acclimatisation of subjects of the animal kingdom;" and besides the gardens in the Regent's Park, they had a farm at Kingston, which, either from the expense or some mismanagement, was given up. On the farm being abandoned, with the exception of the introduction of the Sandwich Island goose; the ashy-headed goose, from the Falkland Islands; the Cereopsis, or Cape Barren goose, from Australia; and a few other minor species of birds—nothing was done until 1852 or 1853, when the acclimatisation of the eland (now considered accomplished) may be said to have com-

menced. The next successful effort was the introduction of certain species of Himalayan pheasants in 1857, which have succeeded very well.

On the establishment of a society in this colony, attention should not only be directed to the introduction of living animals and plants foreign to the soil, but also to adopt efficient and energetic means for the preservation, domestication, and rearing those indigenous to the colony. By a combination of these efforts the resources of the colony will be increased, the field of commerce enlarged, employing labour with profit, adding to our alimentary resources, and forming a combination of the useful and ornamental ; and, by the addition of the acclimatised races to our indigenous stock, increase our material for food, and also our economical products.

A society of this description is not formed for the use of men of science. It may, and no doubt will require their direction and assistance, but it demands the aid of all classes of people, and the good resulting from it will be for the benefit of every one. It ought to be formed of landholders, squatters, agriculturists, breeders of stock, as well as the public generally. When carried out successfully, it will impart life and beauty to our plains and forests, where at present animals are scarce, and it will fill our lakes and rivers with beautiful objects of nature.

While we have been establishing our botanical gardens and adding to our valuable timber, fruit, and flowering trees (useful both for food and manufactures), we have failed in directing our attention to the animal kingdom until by the establishment of zoological gardens in the principal cities of Europe the foundation of the acclimatisation societies was laid.

To be successful in the art of acclimatisation, it will be necessary to study with great observation and accuracy the habits and economy of animals, as numerous failures in the introduction of living specimens, both in this colony and in Europe, have resulted from a want of proper attention to it.

Mr. Ledger, to whom we are indebted for the introduction of those valuable animals the alpacas, devoted a number of years to the study of their habits before he could successfully introduce them into this colony, and we find the mistakes made in the rearing and acclimatisation of animals in this and other countries have been the ideas many persons entertained, that they have only to raise a sum of money for the purpose of purchasing and introducing valuable animals, without acquiring any previous knowledge of their habits or peculiarities, either with regard to

climate, food, or other assistance nature may require; and the result of their attempts has been a failure, and all their plans frustrated.

The society in Paris now publish monthly reports, and offer premiums for the introduction of valuable animals. Among many, there is a premium of a medal of the value of £80 for the introduction of the pure alpaca into Algeria, or the mountains of Europe; the flock to consist of three males and nine females at the least.

A medal worth £40, for the complete domestication, application to agriculture, or employment in the towns, of the kiang, a valuable beast of burden, of great power and swiftness, which is a native of Thibet.

I will make a few remarks upon this beautiful animal, of which a drawing is shown, as I had an opportunity of seeing one alive in the Zoological Gardens, in London, where it had been recently introduced by Major Hay. It was a fine female, and the only example of the animal in Europe. It is found in herds in the high plateau of Thibet, at an altitude of from 15,000 feet to 16,500 above the level of the sea. It has been stated that it will not live under an elevation of 10,000 feet above the level of the sea; but as illustrating that which I before remarked respecting the necessity of acquiring a practical knowledge of the habits of animals, instead of listening to preconceived opinions, it was found that on descending into the low lands, the kiang was never a day sick, and on reaching the plains it became still more inclined to enjoy its freedom, and was obliged to have four men to hold and lead it, and even then, on several occasions, it got away, but was not very difficult to secure again. It was kept a month at Kurrachee, and was then embarked on board a ship, when a large quantity of hay, dried lucerne, and also grain, was laid in for its use; the latter was worm-eaten, and it was long before the animal could be induced to touch it. The passage was long, and the captain's people having used the animal's food to feed their own stock, the kiang was twice reduced to eat the straw with which the sailors' beddings had been stuffed. This proves the hardiness of the animal. At first it refused to drink any tainted water; but before reaching St. Helena, where fresh supplies were laid in, it would eat or drink almost anything.

The French Society also offers a medal worth £40 for the domestication and multiplication of some large species of kangaroo. The winner of the prize must possess at least six specimens, and must have bred two generations in domesticity.

A medal worth £60 for the emu, or the rhea or South American ostrich, on the same conditions as the preceding.

A medal worth £40 was offered for the introduction of any new species of silkworm producing a material that can be spun.

A medal worth £20 for the acclimatisation in Europe or in Algeria of some wax-producing insect, not a bee, and a medal worth £60 for the introduction and acclimatisation of the cinchona or Peruvian bark, producing quinine, in Europe or any of the European colonies. These premiums will give a stimulus to the introduction of valuable products, and must eventually be adopted by the society when formed in New South Wales.

In a paper on acclimatisation in the "Edinburgh Review" for January 1860, the author, enumerating the zoological gardens in Europe, states that they have been made more places of exhibition, than of reproduction and acclimatisation, and then surprises us with the fact, that "practical results have, in fact, been so entirely lost sight of for ages, that the turkey, in the year 1524, the muscovy duck in 1650, the gold pheasant in 1725, and the silver pheasant in 1740, are the only additions to our catalogue of domesticated animals since the Christian era."

Now, in the list of gallinaceous birds published by Prince Charles Bonaparte are enumerated 346 species. Of these we may take 230 or more to be inhabitants of sufficiently temperate regions to admit of their being acclimatised in this colony. They are eatable, prolific, and susceptible of confinement.

Among birds, how many have we domesticated in Australia? First—Varieties of the domestic fowl; Second—The guinea fowl; Third—Geese and ducks; Fourth—The peacock; Fifth—The turkey, the only domesticated product of the New World; and more recently have been introduced the common pheasant—golden and silver, and the ring-necked pheasants.

It has been correctly remarked, that 2000 years have only doubled, even in Europe, the four birds enjoyed by the ancients, and with the imperfect and limited machinery of the Zoological Society of London, the Monal or Impeyan pheasant, the cheer, and three species of kaleege have been brought from the Himalaya. During my recent visit to England, I found them effectually rearing their broods, and in a fair way (with a little effusion of fresh blood among them) of becoming permanently added to the hitherto circumscribed list, as are the golden and silver pheasants and the turkey.

Many persons have asked, what is the use of acclimatisation, or the utility of introducing blackbirds and thrushes? The only

reply that can be made to them is, that every principal article of food, and also the material for our valuable exports, is the result of acclimatisation. But for the animal and vegetable products introduced into this colony, from its earliest formation, and by which means the later and now flourishing colonies have been supplied, we should have been, if existing, a mere nomade and scanty population; and instead of our thousands of wealthy people, there would have been a wandering, half-starved race, subsisting, like the aborigines, upon the produce of the chase, roots, and grubs, and clothed in opossum, squirrel, and kangaroo skins; for our turkeys, geese, ducks, fowls, our horses, cattle, sheep, goats, hogs, &c., are the results of acclimatisation, as also the importation of donkeys. The wheat, barley, and other cereals, our cabbages, turnips, carrots, and other esculent vegetables, as well as oranges, apples, pears, peaches, grapes (producing our variety of wines); indeed, all our fine fruits, and all our exports, are the result of the art of acclimatisation—to which the society in course of formation are desirous of adding other products, both of the animal and vegetable kingdom, valuable as material for manufacture, and increasing the quantity, quality, and variety of our food; for all the principal material for the necessities and luxuries of life obtained in this colony, are the result of acclimatisation. The Acclimatisation Society will be formed on the model of those of England and the Continent, as follows:—

1. For the introduction, acclimatisation, and domestication of all useful animals, birds, fishes, insects, and vegetables, whether profitable or ornamental.
2. The perfection, propagation, and hybridisation of races newly introduced or already domesticated.
3. The spread of indigenous animals from parts of the colony where they are abundant to other localities where they are not known.
4. The procuration, by purchase, gift, or exchange, of animals, &c., from foreign countries.
5. The transmission of animals, &c., from the colony to various parts of the world, in exchange for others sent to the society.
6. The holding of periodical meetings, the publication of reports and transactions, for the purpose of spreading knowledge of acclimatisation, and to inquire into the causes of success or failure.

A very important proposition is made by the acclimatisation societies of Europe, that those members who happen to have facilities on their estates for experiments, and who are willing to aid the objects of the society, should undertake the charge of such subjects for experiments as may be offered to them by the society, periodically reporting progress to the council. This should also be adopted on the establishment of the society in New South Wales.

From the catalogue of animal life, I will now mention some of those valuable to be acclimatised in this colony, or, if denizens of this country, ought to be preserved from destruction and extermination. I will commence with some observations on the sheep, an animal whose valuable fleece forms the staple export article in the commerce of this colony, and state what may be done to add to its value by careful cultivation.

If we take into consideration the care bestowed upon any domestic animal by man, and the extent of the habitable globe over which the species is diffused, the sheep will certainly rank the first; and, therefore, an animal so important to the welfare of mankind, every circumstance connected with it becomes of great and special interest.

The origin of the sheep is involved in great obscurity. My distinguished friend Professor Owen observes that—"The recent progress of palaeontology, or the science of fossil organic remains—remarkable for its unprecedented rapidity—adds a new element to the elucidation of this question, which was so ably discussed by Buffon and the naturalists of the last century. At present, however, the evidence which palaeontology yields is of a negative kind. No unequivocal fossil remains of the sheep have yet been found in the bone caves, the drift, or the more tranquil stratified newer pleocene deposits, so associated with the fossil bones of the oxen, wild boar, wolves, foxes, otters, beavers, &c., as to indicate the coevality of the sheep with those species, or in such an altered state as to indicate them to have been of equal antiquity." Wherever the truly characteristic parts, as the bony cores of the horns, have been found associated with jaws, teeth, and other parts of the skeleton of a ruminant corresponding in size and other characters with those of the goat and sheep in the formation of the newer pleocene period, such supports of the horns have proved to be those of the goat. No fossil horn core of a sheep has yet been anywhere discovered, and so far as this negative evidence goes, we may infer that the sheep is not geologically more ancient than man; that it is not a native of Europe; but

has been introduced by the tribes who carried hither the germs of civilisation in their migrations westward from Asia. Abel was a keeper of sheep, and of their antiquity we have the beautiful pastoral picture portrayed in the following few and simple words from Isaiah xl. 11 :—" He shall feed his flock like a shepherd ; he shall gather the lambs with his arm, and carry them in his bosom, and shall gently lead those that are with young."

Western Asia was probably the original habitat from whence it was spread by the agency of man, and, influenced by climate, food, treatment, and different wild species commingled, have ramified into numerous varieties for the thousands of years the sheep has been subject to man. Professor Owen also observes that natural history "as yet possesses no facts or principles adequate to the satisfactory solution of the question—whether the domesticated sheep was created as such in special relation to the exigencies of man, or whether it was the result of man's interference with the habits and wild mode of life of the argali (*ovis ammon*), or other untamed or unsubdued species of sheep." He also states that "the most ancient records of our race, both sacred and profane, tell us of the sheep as already an animal domesticated for the food and clothing of man ; and it is a significant fact that both the Scythians of the elevated plains of Inner Asia, and the patriarchal shepherds of the plains of Mesopotamia—the earliest instances of pastoral life—dwelt in that part of the earth where the wild argali still exist in greatest numbers."

In 1854, the Zoological Society of London received a fine pair of the wild sheep of the Punjab, allied to the argali just mentioned. It is the orial or *ovis cycloceros*, of which drawings are exhibited of this and the shapoo, or *ovis vignii*. The female has twice bred in the gardens, in 1858-59, and on each occasion produced two female kids, so that the society now possesses a male and five females of this animal, all in a robust state of health, and we may expect that this rare species of sheep will soon become acclimatised in England. There are several other species of wild sheep also found within the limits of our Indian possessions, all of which are capable of acclimatisation in various parts of Australia. These animals are interesting from its being suspected that they may be the type of the first races of the sheep, which, intermingling with other species distributed over the globe, have produced the fine fleeces which have been improving for so many ages, yet have not, especially in this wool-producing colony, attained the perfection it has even done in Europe ; and

one of the objects of the Acclimatisation Society ought to be directed to this important point.

In the wild sheep, the woolly variety of hair is developed in excess, and in the domesticated races the fleece has been modified and improved in various degrees, by crossing the breeds, by choice of climate and pasturage, and by careful attention and defence during its growth, until not only has the original coarse character of the product disappeared, but qualities of wool of various kinds and of different degrees of superiority have been obtained, generally divisible into two classes, one better adapted for "carding," the other for "combing," and both available for a great variety of useful and elegant textile fabrics.

The primitive fleece of the sheep was, no doubt, a mixture of hair and wool, and the effects of climate, cross-breeding, and careful attention, have developed the character of the wool. The Merino sheep of Spain (a race originally imported from England), and the flocks in this colony are pre-eminent as wool-bearers. It is probable that in the early ages of man's history the shepherds may have selected for breeding those individuals on which the wool predominated, and that by following up this system, aided by excessive care, the sheep gradually attained its present condition, so that a wool-bearing breed became at length permanently established.

In the Great Exhibition of 1851, among the wools shown in the French department was one "of singular and peculiar properties, the hair glossy and silky, similar to mohair, retaining at the same time certain properties of the Merino breed of sheep." This was known as the Mauchamp variety, and the produce of a peculiar variety of the Merino breed of sheep. The report of that department states that an inquiry was held, not only of its commercial value and application, but into the particulars of the production of this new kind of wool. It was found to be one of the very few instances in which the origination of a distinct variety of a domestic quadruped could be satisfactorily traced, with all the circumstances attending its development well authenticated. In the year 1828, one of the ewes of the flock of Merinos in the farm of Mauchamp produced a male lamb, which, as it grew up, became remarkable for the long, smooth, straight, and silky character of the fibre of the wool, and for the smoothness of its horns. It was of small size, and presented certain defects in its conformation which have disappeared in its descendants. In 1829, M. Graux, the proprietor of the farm, employed this ram with a view of obtaining

other rams having the same quality of wool. The produce of 1830 included only one ram and one ewe having the silky quality of the wool ; that of 1831 produced four rams and one ewe with the fleece of that quality. In 1833, the lambs with the silky variety of wool were very numerous. In each subsequent year the lambs were of two kinds—one preserving the character of the ancient race with the curled, elastic wool, only a little longer and finer than in the ordinary Merinos ; the other resembling the rams of the new breed, some of which retained the large head, long neck, narrow chest, and long flanks of the abnormal progenitor, while others combined the ordinary and better formed body with the fine silky wool.

M. Graux, profiting by this partial resumption of the normal type of the Merino in certain of the descendants of the malformed original variety, at length succeeded in obtaining a flock combining the long, fine silky fleece with a smaller head, shorter neck, broader flanks, and more capacious chest. Of this breed the flocks have become sufficiently numerous to enable the proprietor to sell examples of the breed for exportation. This variety, mixed with the ordinary Merino, has also produced a valuable quality of wool, known in France as the "Mauchamp Merino." The fine silky wool of the pure Mauchamp breed is remarkable for its qualities, as combining wool having strength, as well as the length and fineness of the fibre. It is found of great value by the manufacturers of Cashmere shawls, being second only to the true Cashmere fleece in the fine flexible delicacy of the fibre, and of particular utility when combined with the Cashmere wool, in imparting to the manufacture qualities of strength and consistence in which pure Cashmere is deficient. This valuable variety ought to be introduced and acclimatised in this colony.

The comparative moist climate of England is unfavourable to the development of the highest qualities of wool ; but they breed sheep for mutton superior to any in the world—not for wool, which it is now ascertained can be produced cheaper than at home in the temperate climates of Australia and New Zealand, and Southern Africa.

Some Shanghai sheep, recently introduced into this colony by Mr. Henry Moore, have wool perfectly white. They possess great reproductive powers, and breed twice in a year, and produce four and five at a birth, the three ewes in the Zoological Gardens of London having in the spring produced thirteen lambs.

Among other valuable animals which may be acclimatised

with advantage would be the European wild boar, the South African river hog, the babirousse from the Eastern Islands, and others from India.

The noble cameleopards, or giraffes, could also be introduced; and so well are they now acclimatised in England that the whole of the beautiful animals now in the gardens were born and bred there. The female originally introduced gave birth to no less than seven fawns before her death in 1852.

We could also procure Polish and other varieties of rabbits and hares; and the delicate and beautiful chinchillas, all valuable for their fur; as also that interesting animal the beaver, and our opossums, flying squirrels, *dasyuri* or native cats, and others, have also delicate and valuable furs; and from the former some excellent and warm socks of most delicate texture have been recently manufactured. Among the bovine animals of the Malay peninsula, the *sapi*, or wild ox, would be a valuable acquisition. The flesh is described as delicious; and Mr. Earl observes "that calves could be obtained with very little trouble, but it would be difficult to get a full-grown animal."

The domestic ox of Bali and Lombok—a large, sleek, thin-skinned species, as graceful as the antelope—could be readily procured; as also numerous others of the same tribe, from various parts of India and the Eastern Islands, both useful and ornamental.

An acclimatisation society ought to direct their attention to the beautiful animals of Southern and Eastern Africa; inhabiting a climate similar to New South Wales, they could be readily acclimatised. Among many I may mention, more particularly among the antelopes, the springbok, the brindled gnu, the common gnu, and the leucoryx. The action of this latter animal is exceedingly beautiful, and its range extends from the Gambia to Abyssinia. As the whole of these beautiful animals have acclimatised well in Europe, there can be no doubt of success attending their introduction into this more favourable climate.

The order of ruminants among the mammalia (which includes oxen, sheep, camels, antelopes, and deer) is of primary importance to mankind, as they furnish the most nutritious kinds of flesh. We become tired of beef and mutton, or an occasional slice of venison, and desire to obtain some class of animals adapted for domestication, the flesh of which may be as savoury as venison and wholesome as mutton or beef, and serving also as a variety from the ordinary food. We now look to the antelopes to supply this desideratum.

The hollow-horned ruminants, or antelopes, form one of the three principal divisions into which the ruminants are divided; of the other two, one includes the sheep and goats, and the other the different forms of oxen and their allies. As the two latter have already furnished us with valuable domestic animals, the acclimatisation societies have been directing their attention to the first-named group, to pay a corresponding tribute to domestic economy.

Of sheep and goats we have about twenty wild species, and of the true oxen not more than a dozen, but of the different kinds of antelopes no less than eighty are known to exist, and no doubt many more may yet be found in the unexplored regions of Africa.

An animal, therefore, that every endeavour should be made to acclimatise in this colony is that noble bovine antelope, as it may be termed, the eland (*Boselaphus orcas*), the largest, heaviest, and altogether the most useful of the tribe. The eland possesses every qualification to make a good domestic animal, it is particularly remarked for its tame and quiet disposition, and as to the question of rearing them it is well known that out of seventeen elands born in the limited space of the Zoological Gardens of London only one has failed to reach maturity.

Of the value of the flesh as food, it is related that "every travelling sportsman in Caffraria agrees upon its fine quality," and a trial made in England in the beginning of 1850, and reported upon in the *Times* by Professor Owen, fully confirms all that they have said; for the eland is no longer exclusively African. "In shape and general aspect," says Captain Harris, "the body of the male eland resembles that of a well-conditioned Guzerat ox, not unfrequently attaining the height of nineteen hands, and weighing 2000 lbs. The head is strictly that of the antelope (as may be seen in the drawing); light, graceful, and bony, with a pair of magnificent straight horns, about two feet in length, spirally ringed, and pointing backward. The flesh is esteemed by all classes in Africa above that of any other animal; in grain and colour it resembles beef, but is better tasted and more delicate, possessing a true game flavour, and the quantity of fat with which it is interlarded is surprising, greatly exceeding that of any other game quadruped with which we are acquainted. The venison fairly melts in the mouth, and as for the brisket, that is absolutely a cut for a monarch. During the greater part of our journey it was to the flesh of this goodly beast that we principally looked for our daily rations,

both on account of its vast superiority over all other wild flesh, and from the circumstance of its being obtainable in larger quantities with comparatively less labour."

The eland breeds readily in confinement, and as it has been found to bear all the vicissitudes of an English climate with no more protection than is bestowed upon valuable cattle, how much easier and less expensive it will be to rear them in this colony, the climate and capabilities of which resemble their own; for in its natural condition the eland frequents the open prairies and the low rocky hills interspersed with clumps of wood, but is never to be met with in a continuously wooded country, rejoicing especially in low belts of shaded hillocks and in the isolated groves of *acacia capensis*; large herds of them are also to be seen grazing like droves of oxen on the more verdant meadows, through which some silver rivulet winds in rainbow brightness betwixt fringes of sighing bulrushes.

Elands were first imported into England by the late Earl of Derby, in the year 1840. They bred; but he unfortunately parted with a male, and accident reduced his stock to a single female. Nothing discouraged, he recommenced, and in 1851 the animals arrived. They were young, and the first calf was not born until 1853. Since then the noble work has proceeded with great success. In the catalogue of the animals living at Knowsley, when the late Earl of Derby died, in 1851, figured five elands—two males and three females, one of which had been born there. The Zoological Society of London succeeded to this little herd by bequest. Lord Derby directed that whatever group of animals should be considered most eligible for the purposes of Acclimatisation, at the time of his death, should be transferred from the Knowsley collection, in its entirety, to the Society's possession. By the advice of the late Mr. Mitchell, Secretary to the Society, the elands were most judiciously chosen, and the result has justified all the expectations which he formed of them. Up to the 29th of April, 1859, twenty eland calves had been produced in England from the Knowsley stock, independently, of any which may have been obtained from three of the earliest born females which were exported to the continent.

The Zoological Society of London disposed of the increase, and from that source they have been extending over England and the Continent, they having realised (my friend Mr. Sclater, the present Secretary, informed me), £170 the pair—male and female—and up to 1860 the Society had remaining in their collection five females and one male, all in good health. Herds

of this noble animal have been founded at Hawkestone by Viscount Hill, at Taymouth by the Marquis of Breadalbane, and at Tatton by Lord Egerton. Lord Hill, it is stated, was the first to profit by the opportunity offered by the Society, and he has now no less than eight of these animals roaming in his deer park, after having slaughtered a six-year-old male, "Nothing" (observes the writer in the "Edinburgh Review,") "can be more stately than the eland leading out his family along the lovely slopes at Hawkestone, where a great rocky ridge rises in the midst of the park, and stretches nearly through it, affording every variety of shelter. There the pale tawny flanks of the antelope glisten in the morning light, infinitely surpassing the dun deer in colour, while they rival them in grace; their great size makes them immediate objects of attention; their clean small legs, full of power, push them over hill and dale at a tremendous pace, and if an obstacle opposes, their faculty of leaping is almost incredible, compared to their weight."

I hope, therefore, after these remarks, we may at an early day welcome the arrival of the eland in this country. Sir George Grey, whom I met in London, kindly promised, after he had sent some ostriches he had ready, to comply with my request for elands; some difficulty, he observed to me, was experienced in finding a proper opportunity of conveying them from the Cape to this colony; and although Sir George Grey is now at New Zealand, I have no doubt he will still, from his zeal for natural history, exert his influence to procure for us this valuable animal.

The kodoo (*strepsiceros kudu*), which may be as easily acclimatised as the eland, as an addition to our economical resources is in no way inferior to that animal. It is stated to combine extraordinary quality of flesh with rapid growth, fecundity, and hardiness, in which it is not exceeded by our best short-horns.

In England the great difficulty in rearing many of these antelopes is their being subject to cold—a contingency to which they will not be exposed in this colony, as it assimilates to their own.

A large number of valuable species of deer from different parts of the world might also be introduced with advantage in the various climates and situations of the extensive Australian continent, for deer spread over all parts of the globe. At one time, it was considered that an exception to this was to be made with respect to Africa, but the discovery of a species in Barbary

has dispelled the idea; but they are rare in that part of the world, their place being supplied by antelopes. Deer may at all times be easily recognised by their deciduous horns.

The red deer, introduced some years since in this colony, thrrove very well, and I believe many roamed about in a wild state.

Among the genus *cervus*, or true stag, there is one recently introduced into the Zoological Gardens of London, and would be a magnificent animal to acclimatise in this colony. It is the noble Wapiti deer (*cervus Canadensis*), a native of the northern parts of America, and said to be the only true stag found in the New World. It has a wide range, extending from 57 deg. north downwards. They breed every year in the society's menagerie. It is a noble animal, and attains the largest stature of the whole group; and some idea may be formed by the magnificent pair of antlers of one of these "monarchs of the forest" recently brought from Puget's Sound, on the North American coast, and which I am enabled to exhibit to you through the kindness of Mr. Cuthbert, of Miller's Point. Horns have been shed by these animals even when in confinement in the Zoological Gardens of London, weighing thirty-two pounds. Mr. Catlin says he found at the foot of the Rocky Mountains a pair of shed antlers, which, when set upon their points, formed an archway, under which the tallest man in the party could walk without touching them.

The yak of Thibet, a beautiful species of the bovine tribe, would be a desirable animal to introduce. It is covered with long glossy hair, which extends over the whole body, unlike any of the tribe, and is used in various manufactures. It is found both in a wild and domesticated state, is used as a beast of burden, and is valuable from being sure-footed in passing over the rugged mountains of its native country. The long hair is manufactured into cloth for tents, which is strong and impervious to wet; the same material is also made into ropes, and is found to be stronger than hemp. The tails are highly valued in the eastern courts for chowries or fly whisks. The cow yields a large quantity of milk, and so rich as to produce better butter than any of the bovine species in Asia. They pasture upon the mountains and in the deep glens of their native country, affording the natives warm clothing and wholesome food. The soft fur which is found covering the hump and shoulders is manufactured by the Thibetians into a fine but strong cloth. I saw several of these animals in the Zoological Gardens of Paris; and a cross between it and a cow produces a hybrid, a beautiful animal, uniting the good qualities of both parents.

The alpacas (animals, with the llamas, allied to the camel tribe) introduced recently into this colony by Mr. Ledger, become one of the most important acts of acclimatisation that has happened in this or in any other country.

Under difficulties of no ordinary kind—in the long, previous study of the habits and economy of these animals—suffering pecuniary and other losses—with the sacrifice of many valuable years of life, overcoming all difficulties, he ultimately succeeds in introducing a large flock of these valuable animals (together with their congeners—the llama, vicuna, and the guanaco), which will ultimately prove of the greatest importance to this colony. Such a spirit of enterprise raises a man, so bold, patient, and persevering, as a benefactor to mankind.

From Mr. Ledger's account, he has had a practical and intimate experience of these animals for the last twenty-four years, and he considers the acclimatisation of the llama and the alpaca in Australia is now established beyond a doubt; and he also considers these animals adapted for the climate and capable of subsisting on the natural grasses of the country. They possess great hardiness of constitution, and actually require less food than the sheep. Mr. Ledger also remarks that, on one occasion in South America, the alpacas were twenty-two days without water. This happened in the desert of Atacama, on the coast, in the heat of summer; and on arriving at water they displayed a greater inclination to bathe in than to drink it.

The meat of the alpaca is tender, wholesome, and savory. When of a proper age, and well fed, it is described as small-grained and rather mottled, the fat white and firm, and when from three to four years old, of full flavour. It is not a greasy, but rather a juicy meat, and easily digested. The flesh of a full-grown one is more nutritious than that of the yearling, although the latter is delicate and savoury. "The hardy nature of the alpaca, its extreme docility and gregarious habits," says Mr. Ledger, "causes it to adapt itself to almost any soil or situation, provided the air is pure, and the heat not too oppressive. It has the power of enduring cold, heat, damp, confinement, hunger, and thirst—vicissitudes to which it is constantly exposed on its native mountains. No animal is less affected by the changes of climate or food, nor is there any one to be found more easily domesticated. The great value of these animals is the wool; and the prices for the first bales of wool sent home, and the report upon it from the principal manufacturers of the article, were decidedly encouraging.

The attention of this society will also be directed to the rearing and domesticating the animals of the country, and to preserve them from destruction. Among the mammals we have the kangaroo of different genera, some of enormous size and others very diminutive, displaying a variety of colours—blue, red, grey, black, tawny, brown, mottled, &c. The native sloth, or koala, often called by the colonists native bear (*phascolarctus cinereus*), the wombat (*phascolomys wombat*), the opossum (*phalangista vulpina*), the bandicoot (*perameles nasuta*), and others, all forming good food; and although the flesh of the kangaroo is said to be dry, I have no doubt it could be improved by being fed on succulent grasses and other suitable food, and it must be acknowledged that kangaroo tail soup is not to be surpassed. Wombat is rarely to be met with, but when procured its flesh is always regarded as a great treat. The lively night animal, the bandicoot, is, when cooked, only to be compared to sucking-pig in flavour. The opossum is good also, especially when curried or stewed; but the monitor lizard, or guana, if one could overcome the repugnance of its appearance, is delicate and excellent food.

Among the birds we have numbers available for the table. The *talegalla* or brush turkey, is excellent, the legs being regarded as the epicure's portion, and the eggs are delicious. The large bustard, the wonga wonga, and bronze-wing pigeons, variety of ducks, curlew, teal, redbills, the *megapodius*, and a number of others, form excellent articles of food for the table.

Owen says, when comparing the Australian with the animals in other parts of the world, that the *dasyuri*, or native cats, play the part of the foxes and martens; the *perameles* or bandicoots, the hedgehogs and shrews; the *phalangers* or flying squirrels, and the *koalas* or native bears, the squirrels and monkeys, the wombats of the beavers, and the kangaroos of the deer tribe.

When acclimatising animals foreign to the soil, I have before mentioned that endeavours should, by domestication, be made to preserve the mammals and birds indigenous to Australia from extermination, as they will prove valuable to us not only for food and ornament, but also as a medium of exchange with other countries; for Australia is rich in zoology. In the inter-tropical regions, we find, besides the *eucalypti* or gum trees, *banksia* or honeysuckles, and other trees of the southern coasts, dense forests of canes, mangroves, &c. Each of these districts has a zoology peculiarly its own. For instance, the *banksia* or honeysuckles, are everywhere tenanted by true

honey-eating birds ; the *eucalypti* or gum trees, by the *tricholossi* or honey-eating parrots, and *ptiloti*, another group of the honey-eaters ; the towering fig trees by the regent and satin birds ; the palms by the *carpophagæ*, or fruit-eating pigeons ; and the grassy plains by the ground pigeons and grass paroquets.

The circumstance of the boles of the trees in this country being destitute of a thick corrugated rind or bark, will doubtless account for the total absence of any member of the genus *picus* or woodpecker—a group of birds found in all parts of the world, with the exception of Australia and Polynesia.

The birds represent many of the types found in Europe ; yet the Australian continent possesses genera exclusively its own, many of which are nocturnal—probably more in proportion than are to be found in any other country, and a remarkable feature connected with Australian ornithology is that of its comprising several forms endowed with the power of sustaining and enjoying life without a supply of water, that element without which most creatures languish and die.

Many of the Australian birds also display an extraordinary fecundity, breeding three or four times in a season, but laying fewer eggs in the early spring when insect life is less developed, and a greater number later in the season, when the supply of insect food has become more abundant. One bird, the black swan, is as prolific in England as in its native country, producing four broods in one year, and proves a very profitable bird to the owner. So well has this Australian bird been acclimatised in England, that during my recent visit to that country, Mr. Wolf, the celebrated animal artist, had visited Mr. Gurney's residence in the country, at that gentleman's request, to make a drawing of one rearing its brood in the winter in the midst of the snow, which drawing I had an opportunity of seeing, and it displayed the old bird, with its sooty-plumaged young, nestled near the banks of an icy river, their dark plumage contrasting with the whiteness of the snow around them.

In Australia, the parrots are a numerous family, forming four large groups. The large cockatoos, such as the black cockatoos, who procure their food of grubs, &c., from the *Banksia*, *casuarina*, or *eucalypti*; the *cacatua*, such as the rose and crimson crested cockatoos, &c., feeding upon the bulbs of plants, more particularly the orchids; the honey-eating parrots (*trichoglossi*), with their feathered tongue and no gizzard, such as the blue mountain and other parrots, subsisting only upon the nectar extracted from the blossoms of the gum trees and other flowering trees yielding honey ; and the

ground and grass paroquets, as the lovely king, rosehill, Adelaide parrots, lory, and others, living upon the seeds of various grasses which abound on the plains.

When contemplating these gorgeously-arrayed specimens and drawings before us, we may consider that, in comparison with others of the animal kingdom, birds may unquestionably take the first station of interest, that is, if sweetness of voice, elegance of form, or beauty and brilliancy of colouring are peculiarities which may be allowed to constitute the superiority of one class of beings over another. They are both poetically and literally the butterflies of the vertebrate animals, flitting from plant to plant, from flower to flower, living less on earth than in the air, and having their wings ornamented with feathers of bright and varied colours. Birds have also been called the flowers of the animated creation, with melody instead of perfume; they display the same beauties of form, brilliancy of colour and charms, which excite our admiration; and how beautifully this is exemplified in these lovely humming birds (of which the drawings are before you), to which these remarks are applicable. Who does not admire birds, their graceful and flitting movements, their harmonious music, as if it were "the tongues of trees," and their intimate union with all the sweet sympathies of external nature—the green fields, the blue sky, the balmy air—have ever made them objects of pleasing interest to man.

In commencing the domestication of our indigenous birds, both useful and ornamental, we cannot select one more interesting than the satin bower birds (*ptilonorhynchus holosericeus*). They have succeeded both in England and in this city, in being kept in a state of captivity, but have not yet built a nest, laid eggs, or reared their young; indeed, the nest and eggs of this bird are at present unknown. They are amusing, playful, and delightful mocking birds, imitating the notes of the various birds within hearing.

The adult male satin bird has a glossy blue-black plumage, of satiny texture. The young males and females are of a dull green colour, which in the males becomes spotted with black, and they do not attain their full plumage for three and four, or even five years.

The satin bower birds are found in New South Wales, but the pink-necked or spotted bower birds (*chlamydera maculata*), whose habits are precisely similar, are found in Central, Northwest, and Northern Australia.

The bower constructed by these remarkable birds is, perhaps,

the most extraordinary event in bird architecture, more especially as not being a nest for the young, but a playing-place—a decorated ball-room as it has been called—wherein the young couple flirt, and make love previous to entering upon connubial life. It is constructed with a consummate skill, amusing to witness. They may be observed constructing their runs at all seasons of the year, and imitating, when at work, the notes of the various birds around. The bird is seen, from the remains of an old broom, or any twigs thrown into the aviary, to take a twig, place it firmly in the ground, slightly bent inward, the bower being left open at the top, and forming a run of an uncertain length. The ornamentation of this run is a source of constant solicitude to the birds. Almost daily they make a fresh arrangement of bright coloured feathers, shells, bleached bones, bits of coloured rags, and other decorative materials, which they bring from long distances when in a wild state, and appropriating every ornament placed within their reach when in captivity. Like the magpie, it is a great thief, appropriating all the bright or shining articles it can procure for the purpose of decorating their playing place. When completed, the male entices the female, "fully aware, no doubt," as a satirical writer observes, "that the fair are attracted by a handsome establishment." It is then most amusing to witness the antics of these birds, running in and out of it, performing various polkas, making attitudes to each other, the males setting their feathers in the most grotesque manner, and perform a galop with as much enjoyment as many of the human bipeds.

There is another species which has received the name of "cat bird" (*Ptilonorhynchus Smithii*). It is of a green colour, more or less spotted with white. It has received its colonial name from the singular note it utters, which can only be compared to the nightly philharmonic concerts of the domestic cat, and the sound must be a source of great delight to the Londoner exiled in the bush, bringing before him agreeable reminiscences of home.

The various pigeons indigenous to the colony, such as the wonga wonga, harlequin, and other bronze-wings, are all delicious for eating. The first named has the flesh white, delicate, and of surpassing flavour. The large fruit-eating pigeons of the northern districts would also form a great acquisition. They are strictly arboreal in their habits, frequenting the lofty fig-trees and feeding upon the fruit, and their flesh is excellent eating. The beauty of their plumage would also render them an acquisition to the aviary.

The brilliant rifle birds (allied to the creepers), of which there are three known species, two of large size, and the no less elegant regent birds, would be a great acquisition as ornamental birds; and I have no doubt they could be successfully reared in confinement by placing them in large wire enclosures with trees, in a manner similar to that erected by Mr. T. Holt at Cook's River, for the blackbirds and thrushes.

It would be well to impress upon the public in this colony the necessity of preserving birds to a certain extent, so as to fulfil what nature has ordained with infinite wisdom and care, the equalisation of the races, and of obtaining a knowledge of their habits and economy, which will be found valuable to man as regards his comfort, as well as affording him security from important depredations. Many, regardless of this, are continually destroying useful animals, and become thereby the means of permitting those of a noxious kind to increase. In October 1856, the territory of New South Wales suffered severely from the devastation occasioned by aphides; and all the cruciferous vegetables, as cabbages, &c., were almost entirely destroyed by them throughout the colony, when many of the soft-billed birds, ruthlessly killed or driven away, might have prevented the evil. Every endeavour should, therefore, be made for the preservation of our useful and ornamental indigenous birds and animals, for if the wholesale destruction of birds and their eggs proceed in the same ratio as at present, and the acclimatisation societies in Europe rear and preserve them, there is no doubt we shall have to import many of our valuable birds from Europe, for, among many others, the emeu is becoming scarce in this country. In Tasmania, it is extinct in a wild state. Birds have been found of such importance in Europe to the gardener and agriculturist, that in the French Senate, in June last, M. Bonjeau read a report on four petitions, praying that measures might be taken to preserve birds which destroy insects hurtful to agriculture. The report is an amusing essay upon insect-eating birds, their habits, anatomy, and species of food. It treats at length of the ravages of insects, and the importance to man of the objects they destroy. France, as well as other countries, is infested with thousands of species of insects, nearly all of which prey on what should serve the purposes of man. The first section of the report is headed, "Importance of Birds to Agriculture." It states that the wire-worm consumed £160,000 worth of corn in one department alone, and was the cause of the three deficient harvests which preceded 1856. Out of 504 grains of colza gathered at hazard at Versailles,

all but 296 had been rendered worthless by insects. The reduction of yield in oil was 32.8 per cent. In Germany, according to Latreille, the larva of a species of moth (*phalena monacha*) consumed whole forests. In Eastern Prussia, three years ago, more than 24,000,000 cubic metres of fir had to be cut down because the trees were attacked by insects. Man is unable to cope with these destroyers of the produce of his labour. His eye is too dull to perceive, and his hand too slow to catch them. Without the aid of birds he would be vanquished in the struggle. The commission excludes birds of prey, such as magpies, ravens, &c., with the exception of buzzards and rooks, from the benefit of its protection, because the buzzard consumes about 6000 mice yearly, and the rook an incalculable amount of white worms. Sparrows are restored, and their usefulness shown by reference to the fact, that when their destruction was attempted in Hungary winged insects increased so rapidly that rewards for the destruction of sparrows were suppressed, and given for bringing them back. Frederick the Great ordered the destruction of sparrows, because they ate his cherries; but in two years' time he found his cherries, and all other fruits, consumed by caterpillars. In a sparrow's nest on a terrace in the Rue Vivienne were found the remains of 700 cockchafers. Owls and birds of that class, which agricultural ignorance pursues as birds of evil omen, ought to be welcomed. They are ten times more useful than the best cats, and not dangerous to the larder. The martens that were killed were found to have in their stomachs the remains of 543 insects. It recommended a prohibition of bird-nesting, and destruction of eggs or young birds. The petitions were referred to the Minister of Commerce and Public Works.

There is an elegant bird among the gallinaceæ which might be introduced into this country—the curassow (*crax carunculata*), a native of South America, ranging from Southern Mexico to the southern confines of Brazil. There are about a dozen species of this bird. They are as large as a turkey, and as they endure the climate of England, with very moderate protection, they could easily be acclimatised in Australia. In the last century they were reared in Holland and brought to table, and at present several instances are known of their breeding freely in the vicinity of Paris. Their introduction would certainly be most desirable, not merely on account of their size and beauty, but also for the whiteness and excellence of the flesh, which is said by those who have eaten it to surpass that of the guinea fowl or of the pheasant in the delicacy of its flavour.

All the valuable species of partridges, quails, &c., from various parts of the world may also be introduced, and that delicious bird the ortolan (*emberiza chlorocephala*), or green-headed bunting. These latter birds are so little quarrelsome that they may be admitted harmlessly into a general aviary, or even into a large cage occupied by a variety of small birds. "Sleek good-nature" is described as their principal characteristic; they look fat, and are fat. Their obesity of body seems a necessary consequence of their equanimity of temper.

The larger and typical gallinaceous birds are entirely wanting in Australia, being represented by birds whose mode of incubation indicates an inferiority of type, as the megapodius (*megapodius tumulus*), leipoa or mallee bird of the Murray (*leipoa occellata*), and the talegalla or brush turkey (*talegalla Lathami*), all considered good eating, and by many considered, when young and in the perfection of the season, preferable to our European game.

It is to the last bird, the brush turkey, I shall now direct your attention; it forms part of a great family of birds inhabiting Australia, New Guinea, the Celebes, and the Phillipine Islands, and whose habits and economy differ from every other group of birds which now exist in the world. In their structure they are nearly allied to the gallinaceous birds, while in some of their actions and mode of flight they resemble the rails; they do not incubate their eggs, and are, consequently, regarded by ornithologists as the lowest representatives of their class. The brush turkey is now becoming acclimatised in England; the young are produced in the Zoological Gardens of London, and I hope that we shall soon see it forming its mound, and the young birds emerging from it, in or near Sydney; for, as I have before remarked, they are an excellent article of food, and are well worth rearing for the table.

A very interesting account is given in the proceedings of the Zoological Society of London of the incubation of these interesting birds, and the production of their young; it also proves how easily they can be domesticated, and their tameness, and the interest attached to them from their peculiar habits, may induce us to lose no time in making an early trial of them here. The pair of talegallas during the spring and summer of 1860 formed a large hatching mound, composed of leaves, grass, earth, and other materials. Within this heap of warm fermenting gatherings, the female deposited twenty eggs, with the small end downwards. The time of laying, the interval of time between each egg, and the period of incubation are at present unknown.

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On the morning of the 26th of August, a young *telegalla* crept out of the mound, and quite regardless of its parent, ran about in search of worms and other insects, upon which it fed with as much adroitness and apparent knowledge as the chick of a common fowl would exhibit at a month old. Towards night this young bird flew about among the branches of the trees and shrubs in search of a safe roosting-place, and, having selected one about six feet from the ground, settled down, and appeared as comfortable and unconcerned as an adult bird—the female taking no notice whatever of her offspring. Upon looking into the mound two days afterwards (28th), a second young bird was observed moving about, and busily engaged cleaning its feathers with its bill, the wing feathers being at this time enclosed in quill sheaths. This young bird remained in the mound about twenty-four hours after it had escaped from the shell; and during this time, the wing and other feathers were freed from their covering, so that the bird was enabled to fly immediately upon quitting the mound, which it did on the morning of the 29th. This second young bird conducted himself in the same manner as his predecessor. The two young birds took no notice whatever of each other, or of the old female—the three birds appeared perfectly independent of each other—eating, drinking, and roosting separately, and, although an occasional small voice was heard from the young birds, it did not appear to indicate or excite any notice among them. These young birds grow amazingly—so rapidly, that at the age of three months they can scarcely be distinguished from the adult birds. In this colony it is about the month of October that the young birds make their appearance, at which season of the year their food—the grasshopper—is also found very abundant.

From the preceding observations it appears that two or three days may elapse between the laying of each egg. The young birds will consequently come out of the mound in the order in which the eggs were laid, as it is evident that incubation must commence immediately the egg is laid. If, therefore, twenty eggs are laid in forty or sixty days, there must be this number of days' difference in the age between the first and the last of the brood, and no two of the young birds could possibly be of the same age.

Perhaps the most remarkable feature connected with this bird is the very perfect development of the young, reminding us strongly of the next division of the vertebrate animals (*the reptilia*).

In the *talegalla* we seem to approach the reptilian character, not only in the form and general appearance of the eggs, but in the manner in which they are deposited and the absence of care bestowed upon the young. I believe, with this exception, all birds feed or provide for their young; while, on the other hand, I am not aware any reptile is known to do so, and that all the reptiles that lay eggs leave them to hatch, and the young to provide for themselves—their young, as in the *talegalla*, coming forth in a very perfect and well-developed condition, and being enabled to seek and obtain their food without the aid of the parents. It is for this reason, as I have before remarked, the family *megapodidæ* are placed in the lowest form of birds. I regret to hear, by my last letters from England, from the Secretary of the Zoological Society, and Mr. Alfred Denison, that the only male bird in the possession of the Society is dead, and all survivors are females. This is more to be regretted, as they had commenced with success to acclimatise them in England. Those gentlemen have requested me to endeavour to procure them some young males. Now, had we an Acclimatisation Society established in Sydney, we could readily supply them, receiving in exchange mandarin ducks or Himalayan pheasants. There is an anecdote related connected with this bird which may be quoted as illustrative of the theoretic study of natural history not supported by reference to the living book of nature. "Because the *talegalla* had a bare head and rather straight claws, was black in colour, with some brilliant skin about the region of the neck, he was pronounced to be an excellent vulture by a theorist who lacked a type to fill a vacancy in some triangular, circular, or oval scheme, in which he had firmly convinced himself all nature and every group could be thrust. Now, the bare head of the *talegalla* is convenient for plunging into the decayed leaves of the mounds; the bristly hairs which protect it throw off all impurity and moisture much better than feathers would do; and the strong, straight claws and gigantic feet are not intended to deal with carrion, but are most exquisitely adapted for picking up the grass, leaves, and earth, which he has to throw from long distances to the central mound. The mystery, which is so simply resolved by observation, could never have been divined in a gallery of skins.

Another remarkable bird, native of New South Wales, is the *menura superba*, "lyre bird or pheasant of the colonists." For a long time this bird divided ornithologists as to the situation it should occupy in the natural system, and for upwards of fifty

years from its discovery but little was known respecting its habits and economy. Having only external structure to guide them, it was placed amongst the gallinaceous birds. Notwithstanding its great size and extraordinary form of tail, in every other point it differs from the gallinaceæ. It forms one of the inssessores, or perching birds; and by one ornithologist, from its covered nest, it was placed among the wrens, but it is more correctly classed among the thrushes. The young are helpless and blind when hatched. To rear these birds it was recommended to place the eggs under a hen. Should this have been effected, judge of the surprise of the hen at her blind and feeble progeny. It will be necessary to preserve these birds from extermination, especially the *talegalla* and that family, for they are now becoming scarce, and, from the present wholesale destruction of the eggs and birds, they will soon be numbered with the extinct birds—as the Phillip Island parrot, the gigantic New Zealand rail (*notornis mantelli*) and many others. It is probable but that few persons have had an opportunity of observing this interesting bird in this, its native country; while, thanks to the benefit resulting from acclimatisation, it can be seen daily in London, together with a number of the Australian mammals and birds, in an agreeable state of domestication.

For the beautiful specimens of the male and female of these birds, and for the other preserved skins of the elegant birds on the table, I am indebted to the great kindness of Dr. William Houston, of Castlereagh-street, as without them I could not illustrate my subject, as no public institution in the colony was sufficiently liberal to permit a specimen to be removed from their collection for the illustration of the subject.

Among the beautiful gallinaceous birds it would be desirable to introduce into this colony and acclimatise, the elegant Himalayan pheasants, such as the Impeyan pheasant or monal, the cheer, the purple, white-crested, and black-backed kaleege, the tragopan or horn pheasant, and the Java and black-shouldered peacocks. All these valuable birds have been reared successfully in England, and could readily be acclimatised in Australia.

Mr. Sclater, the Secretary of the Zoological Society of London, in his report on the pheasants, observes that, at the commencement of the year 1860, the breeding stock of Himalayan pheasants consisted of three pairs of the black-backed, two pairs of the white-crested, and one pair of the purple kaleege, one pair of cheers, and three of Impeyans. These ten females produced altogether 141 eggs, being twenty-seven less than the same

number produced in the previous year. The number of young birds hatched, however, was greater, being eighty-two instead of sixty-two. But the number reared, owing to the bad weather, for which the summer of 1860 has been notorious beyond all precedent, has been slightly less—being only forty-five instead of fifty. The whole of the young birds have been disposed of among the members of the society except the four Impeyan pheasants, for which there are numerous applicants as soon as the sex of the birds shall be ascertainable.*

The next bird to which I will direct your attention is the Mandarin duck (*aix galericulata*), a native of the north of China. These beautiful birds are regarded by the Chinese as emblems of conjugal fidelity, and are usually carried about in their marriage processions. We have instances of attachment equal to, if not surpassing that of the dove, and the pair are usually seen close together, the male watching during the time the female sleeps, and the female watching while the male sleeps. They roost in elevated situations upon trees, high rocks, &c. The Chinese name for the mandarin teal is een yeong; and, with reference to the same conjugal quality, is applied figuratively to two kinds of fine black teas, which are generally mixed together. These are pekoe and a superior kind of souchong. When I first saw this bird alive in China, and gave some account of it in a work I published some years since, entitled, "Wanderings in New South Wales, Singapore, and China," I found it impossible to procure a pair of living birds, even at a very high price; and it is but little more than two years since that a request was made from this colony to the Governor of Hong

* As it is important in rearing birds to ascertain with some degree of accuracy the number of days of incubation of birds, I have given the following table, as published by the Zoological Society of London, and it appears that the time of incubation is as constant in each species of bird as the period of gestation in each species of mammal. Emu (*Dromacæs Nova Hollandæ*), fifty-six days; American ostrich (*rhea Americana*), thirty-five days. (The eggs of the emu and rhea were hatched in the Society's incubator.) Impeyan pheasant (*Lophophorus Impeyanus*), twenty-eight days; cheer pheasant (*caucus Wallichii*), twenty-eight days; purple pheasant (*gallophasic Horstfeldii*), twenty-four days; white-crested kaleege (*gallaphasic eiderciatus*), twenty-six days; black-backed kaleege (*gallaphasic melanotus*), twenty-four days; Californian quail (*callipepla Californica*), twenty-one days; crowned pigeon (*goura corrñata*), twenty-eight days; crested pigeon (*ocypaps lophotes*), fourteen days; black-necked swan (*cygnus nigricollis*), thirty-five days; black swan (*cygnus atratus*), thirty-five days; cercopsis goose (*cercopsis Nova Hollandæ*), thirty-five days; Sandwich Island goose (*bernicla Sandvicensis*), thirty-one days; ashy-headed goose (*chloephaga poliocephala*), thirty days; muddy wildrake (*casarca rutila*), thirty days; summer duck (*aix sponsa*), thirty days; Mandarin duck (*aix galericulata*), thirty days.

Kong, to which he replied, that "it would be easier to send a pair of mandarins than a pair of mandarin ducks." But thanks to the benefits resulting from acclimatisation, I found, during my recent visit to London, that I could have purchased them from the Zoological Society of London for six guineas the pair—less than one-half the amount demanded for them in China, and not then procurable even at their own exorbitant price. They were thus introduced into Europe: Two pairs reached a skilful amateur at Rotterdam, and from these individuals the whole of the birds of this species now in Europe have descended. This bird appears to be indigenous to the country north of Pekin, whence the mandarins at Canton and in the south generally obtain a supply for their aviaries.

There is a fact in connection with the rearing of this bird which ought not to be passed unnoticed. In my work before alluded to, I stated that the male bird in its native country loses its gay plumage in May, and remains until August in a dress which bears a close resemblance to that of the female; and as it was desirable to ascertain if a similar change took place in England, the following was the report as given by Mr. Gould. The first egg was laid on the 2nd of May, the female began to sit on the 20th, and the young were hatched on the 20th of June. When the female commenced sitting the male began to throw off his fine plumage, and by the 1st of July had become so like the female as to be scarcely distinguishable; the primary feathers, which are only moulted once a-year, were not fully perfected until the 3rd of August; these feathers were then beautifully green, with a narrow stripe of snow white about an inch in length from their tips. The bill at this period was less brilliant, and the old male, female and progeny were all so similar in size and colour as to render it difficult to distinguish one from the other—all having a beautiful olive-mottle plumage, both chaste and elegant. By the beginning of October, the young males of the broods, as well as the old drakes, had all assumed their full and gorgeous livery—the youthful birds being scarcely inferior in beauty to the adults. A more interesting and lovely sight was never seen in the gardens of the Zoological Society, rich as it has been in objects of the highest interest, than was to be observed in the aviary containing a double brood of mandarin ducks. At least ten out of the sixteen birds were males, which during a part of the day were frequently to be seen perched upon the branches of trees, and at others were exhibiting in the proudest manner their lovely hues while swimming in the oval stone

basin provided for their use. The summer duck of North America, almost as brilliant as the mandarin duck, it would also be desirable to introduce.

A very interesting method has been given in the proceedings of the Zoological Society of 1859, of preserving the eggs of birds for a sufficiently long period to allow of their being brought from distant places and afterwards hatched; and Mr. Bartlett, now superintendent of the gardens, says he was successful in hatching and rearing the young from some eggs kept three months, and he had no doubt that, under favourable circumstances, they may be kept for a longer period. The following is the method:—The eggs must be newly laid, or nearly so, and preserved in the following manner:—“Obtain the gut of any animal, whose intestine is large enough to admit the egg, and, having carefully cleaned the gut and rendered it free from fat, dry it as much as possible in powdered chalk or other earthy matter. Pass the egg into the gut, tying it close to the shell at both ends of the egg, and hang it up in a cool, dry place, until it is quite dry. Two, three, or more eggs can be tied in the same gut, like a string of beads, or they can be tied separately. When thoroughly dry, they may be packed up in a box with oats, wheat, or any other dry grain or seeds, until the box is quite full. The object in having the box full is for the great convenience of turning the eggs. This is accomplished by turning the box bottom upwards, which should be done occasionally. Thus the whole of the eggs may be effectually turned with very little trouble. The eggs thus packed must be kept in a dry, cool place, and ought not to be taken out or unpacked before the hens are at hand for hatching them. Upon wishing to place them under a hen or otherwise, if the dry gut be cut with a sharp knife it will peel off without in any way injuring the shell of the egg.” This will be a valuable fact for the cause of acclimatisation.

To show how easily large birds can be hatched under hens, the fine birds recently introduced by Mr. Petherick from the White Nile, the *baleniceps rex*, and which I saw alive in the Zoological Gardens last year, were hatched from eggs placed under a hen. This bird inhabits the White Nile, and Mr. Petherick read a paper before the society (during which I was present), in which he stated that the “breeding time of the *baleniceps* is in the rainy season, during the months of July and August, and the spot chosen is in the reeds or high grass immediately on the water’s edge, or on some small elevated and dry spots entirely surrounded

by water." The birds before laying scrape a hole in the earth, in which, without any lining of grass or feathers, the female deposits her eggs. As many as a dozen eggs have been found in the same nest. Numbers of these nests have been robbed of both eggs and young, but the young birds so taken have invariably died. After repeated unsuccessful attempts to rear them, by two years' perseverance he at last succeeded in hatching some eggs under hens. As soon as he got the hens to lay, and in due time to sit, by replacing several of their eggs with half the number of those of the *balaniceps*, as fresh as possible from the nest, the locality of which was previously known, he eventually succeeded in hatching several birds. These ran about the camp,* and, to the great discomfort of the poor hens, would persist in performing all sorts of unchicken-like manœuvres with their large beaks and extended wings, in a small artificial pool constantly supplied with water, and the little pond was supplied with live fish, upon which, and occasionally the intestines of animals chopped into small pieces, they were reared.

The ostriches of Southern Africa would acclimatise well, and be valuable for their magnificent feathers, now becoming rare and expensive; and besides the black and white ostrich plumes, there are a number of birds in this and other countries that could be introduced, if only for their feathers as ornaments.

It will be impossible to enumerate all the valuable birds that could be introduced with advantage; but when speaking of pheasants I forgot to mention that the *phasianus versicolor* from Japan, and the *P. torquatus* or ring-necked from China, have crossed with our common pheasants, and produced hybrids of greater size and weight than either of the parents, and the plumage is beautiful. These were shown me by Mr. Gould during my recent visit to London, who shot them in Norfolk; and at the Aberdeen British Association, when Prince Albert visited the zoological section, so much interest did he take in the subject, that he requested Mr. Gould's paper on the pheasants to be deferred until his arrival, when he listened most attentively to the description, and examined the birds with the keenness of a sportsman and the practical eye of a naturalist, and expressed his admiration of the beauty of plumage and increased size of the hybrid breed.

Among many other valuable birds worth acclimatising, this

* The fact of the young birds running about immediately they are hatched in search of food is a remarkable fact, considering the class of birds to which, judging by their anatomical structure, they are considered to be allied—the herons.

beautiful bird, the fire-backed pheasant, would be a desirable acquisition. It is so named from having upon the back, just above the tail, a mass of feathers of a brilliant luminous and metallic colour. In some light it is said to be so bright as to resemble a flame of fire. Two white feathers branch from the tail with a graceful curve. The hen bird is of plain reddish plumage. There are two species—the *E. ignitus* and the *explosorius Veilloti*, and both species are fine and ornamental birds. The Earl of Derby succeeded in rearing a brood of the latter species, but the race was not perpetuated owing to the want of a congenial climate. Both the species would be worth naturalising in this colony.

There is also the banded land grouse, the Thibetian and whistling land grouse, natives of Northern India, the flesh of which is delicate and well-flavoured. The lerwa partridge or Himalayan grouse (*lerwa navicolla*), as it is also called, would be a valuable acquisition; the flesh is white, succulent, and possessed of a high flavour. The painted and the Ceylon partridge, or spur fowl (*galloperdix*), its flesh is considered in Ceylon superior in flavour to any other game in the island; it ate and looked like grouse. The pucras pheasants, of various species from the Himalaya; the sanguine Francolin also from India; and valuable and interesting as are the gallinaceous birds of India, both as objects of beauty and supplying the human race with food. The *tetraogallus* or snow partridges, from the Himalaya, are birds which will be found even still more valuable for acclimatisation, and could be readily domesticated in the colder regions of the colonies. To all these, for introduction into the colony, the society will direct their attention. The Mooruk, of which I sent three living specimens to England, and which are now alive in the Zoological Gardens, Regent's Park. Through the liberality of Mr. Cuthbert, of Miller's Point, we have now two living specimens at present in the Botanical Gardens of Sydney; they are young birds, male and female, and will be a great acquisition to our other valuable specimens.

The large drawings of the eland, Punjab sheep, koodoo, and others, were drawn by Master William E. Bennett, with the exception of the Australian bustard, for which I am indebted to the kindness of Mr. Krefft. The beautiful coloured engravings are principally from the magnificent works of Mr. Gould on the birds of Asia, Australia, and the humming birds.

As fish is so necessary an article of food for all classes, being digestible and nourishing, an Acclimatisation Society should

direct their attention to the introduction of new and valuable kinds, as well as preserving and increasing those already existing in our rivers, bays, and salt-water creeks—for fish fall an easier prey to man than the beasts and birds, being more distinguished for the size of their heads than for the amount of brains lodged in them. The range of fish is very various; some are migratory in their habits, others stationary. Among the fresh-water fish, some inhabit waters of a purer or impurer kind; the salmon, trout, and others inhabiting the purer streams, whilst the eels and other species luxuriate in the more stagnant pools.

Artificial ponds for the maintenance of fish is a very early invention, and was even known among the ancient Egyptians. Vivaria among the ancients are mentioned by Columella, Varo, and Pliny, and fish was brought from a great distance; and an extraordinary fact is mentioned by Columella—that rivers and lakes were turned into natural vivaria, by carrying to, and depositing therein, not fish only, but the spawn of all such species as, though born at sea, are in the habit of penetrating some way up estuaries or streams. He speaks of the perfect success of the experiment in several rivers.

Various kinds of fish have been and are still being introduced, by preserving the ova, into different waters of England and on the continent, in localities where previously they had no existence; they have succeeded well, and where congenial food is plentiful the result is perfectly satisfactory.

Alluding to the food of fishes, at one time it was a popular idea that salmon only lived upon microscopic animals; the reason of this error was, that the salmon, like most fish, expel the contents of the stomach when harpooned or hooked. It is an instinctive act to lighten themselves, and make easier their efforts to escape; and I believe it to be common to the whole class. This is the reason why salmon, when caught, never have any food in the stomach, wherefore some sagacious physiologists have conceived that this rich and delicious fish was fattened, forsooth, upon microscopic entomostraca, crustacea visible only to the naked eye in minute specks, when every one of the hundred-and-odd teeth of the salmon is bigger than some hundreds of these minute crustaceans.

The Australian blacks on the coast are expert fishermen, and Mr. Edward Hill, who possesses much information on the subject, informs me that when the beautiful waratah or native tulip blooms, it is a well-known sign to these children of nature that the sole (a rare fish to be seen in the Sydney market, but of

excellent flavour) is very abundant on the sand banks about Botany Bay and in the vicinity of Cook's River, where they may be captured at early dawn, before the ripple comes upon the water. According also to the flowering season of other trees and shrubs, the blacks know the season when the mullet, schnapper, Port Jackson shark (*Cestracion*) or other fish are plentiful in the bays or harbours of the coast. But the most extraordinary method of fishing among the aborigines is that related by Mr. Fairholme, of their fishing for mullet aided by porpoises:— “Near the deserted Pilot Station, at Amity Point, near Brisbane, Queensland,” he says “some of the natives may constantly be found during the warmer months of the year fishing for mullet.” In this pursuit they are assisted in a most wonderful manner by the porpoises. It seems that from time immemorial a sort of understanding has existed between the blacks and the porpoises for their mutual advantage, and the former pretend to know all the porpoises about the spot, and even have names for them. The beach consists of shelving sand, and near the shore are small hillocks of sand on which the blacks sit watching for the appearance of a shoal of mullet. Their nets, which are used by hand, and are stretched on a frame about four feet wide, lie ready on the beach. On seeing a shoal several of the men run down, and with their spears make a peculiar splashing in the water. Whether the porpoises really understand this as a signal, or think it is the fish, it is difficult to determine, but the result is always the same; they at once come in towards the shore, driving the mullet before them. As they near the edge, a number of the blacks with spears and nets quickly divide to the right and left, and dash into the water. The porpoises being outside the shoal, numbers of fish are secured before they can break away. In the scene of apparent confusion that takes place, the blacks and porpoises are seen splashing about close to each other. So fearless are the latter, that strangers, who have expressed doubts as to their tameness, have often been shown that they will take a fish from the end of a spear when held to them. The oldest men of the tribe say that the same kind of fishing has always been carried on as long as they can remember. Porpoises abound in the bay, but in no other part do the natives fish with their assistance.

A beautiful little fish for the aquarium is one of which this is an engraving, in the Proceedings of the Zoological Society of London, from a drawing from life by Mr. G. F. Angas, and who succeeded in capturing and keeping them alive. It is named the

"gem fish," the *glypisodon viocellatus* of Cuvier. They are found in pools among the rocks at low spring tides, both on the outer coast and in several localities inside the harbour of Port Jackson. It was first met with by Mr. Angas in a pool at Coogee Bay. The extreme brilliancy of the colour—gold and azure—as the little creatures dart in and out amongst the cavities of the rocks, reminds one of jewels flashing in the sunlight. They are remarkably shy, and on the slightest noise, or the shadow of a person approaching the pool, they dart in and conceal themselves under the ledges and in the holes of the rocks; hence they are very difficult to catch. They generally make their appearance on the coast about November, and remain till May; during the winter months they have not been seen. The one figured is the size of life; they vary in size from one to four inches in length. As may be supposed, they are exquisite objects in the aquarium, and eat small worms and crumbs of bread greedily when in confinement.

One of the first acts of the Acclimatisation Society, when established, would be to introduce that fine and delicious fish of the perch tribe, called the Murray River cod, and which has been introduced with perfect success in the Yarra, and lately in Lake George, by the Honourable the Speaker, Mr. Murray, in 1848. Suitable localities could also be found in the Nepean, Hawkesbury, and such rivers and lakes in the colony where it does not at present exist.

Sharks and other fish might be procured for their oils, both for economical and medicinal purposes—and for the latter might equal the cod liver oil now imported in such large quantities. At present the dugong oil is used as a substitute, an animal belonging to the mammalia, and is said to be beneficial to invalids afflicted with strumous disease; but its virtue, except as a nutritious diet, is very questionable. It is a curious fact that, while we regard this and cod liver oil as new remedies in pulmonary diseases, in 1790, Valliant, in his travels in Africa, says:—"At the Cape the fat of the hippopotamus is thought so wholesome that they affirm, if it is taken in regular portions, it will radically cure all disorders of the breast." "I kept some by me," he also observes, "that was not thicker than the oil of cloves in cold weather." This is also a property which obtains in the dugong oil. Indeed the whole of these oils may be considered more valuable as a nutritious diet, in those constitutions requiring it, than from any particular medicinal property they possess. The benefit derived from these fatty substances is

considered to depend on the production of heat by means of its oxygen and hydrogen ; by lubricating the mucous surfaces, and by being stored up in the tissues without transformation. It is considered by many—but requires confirmation—that it promotes assimilation of food, by affording the oily capsule to the globule of albumen in the chyle.

The introduction of the salmon into Australia still excites the highest interest. The attempts have cost nearly £600, but have unfortunately failed ; but many who have studied the subject of the transport of this fish in a scientific manner, are convinced that young salmon, if properly and scientifically watched, during a long voyage, would arrive in safety. I consider that the ova of this fish could be introduced from the rivers of California into many of the Australian rivers, and found suitable for it with greater facility than from Europe ; and if I am borne out in this opinion by some in this colony—Mr. Black, for instance, who is conversant with the transport of fish ova—I think the trial ought to be made. I cannot see why the ova of various fish could not be transported in a dried state, enveloped in moss, and placed in water on their arrival at their final destination. Water-courses have been dried up in India, the fish have disappeared, but on the return of the rains the lakes and rivers are at their full height, and teeming with fish. The probable reason that could be assigned for this is, the ova, properly vivified, lying dormant in the mud, increase in vitality, and on the rise of the waters become hatched, and thus, as if by magic, the streams are filled with the finny tribe.

We are now aware that the rivers in Europe are fertile with fish. The best system of fish culture, the utilising of the water, or mode of multiplying fish, is by the artificial production of them ; a mode long practised by the Chinese, and now extended in all the rivers of Europe, and when properly carried out “fish-hatching” is found to pay remarkably well.

Now a great deal has been said about “gouramy,” an excellent fish, and attempts recently made to introduce it from the Mauritius failed from a little mismanagement, which on another trial could be easily rectified. This delicious fish is found in the rivers of Java, and in that island it has been supposed to have been introduced originally from China. If so, it was probably by the Chinese method of preserving the ova ; and allowing this to be correct there would be no difficulty of conveying it by a similar method from Java to the fresh waters of this colony, as the distance would not be

greater. The "gouramy," of which the drawing will convey an idea of only its external character, is as beautiful in its hues as singular in its form. The ground colour is orange, that of the back of a dark bronze, which passes in undulating lines over its sides. Its form is of a roundish oval, the head short, with a somewhat recurved snout, but the creature is particularly distinguished by the prolongation of the pectoral fins into thread-like processes several inches in length. It is celebrated for its flavour, and the native princes of Java keep these fish alive in large quantities in reservoirs. It has been acclimatised for some length of time at the Mauritius, where it thrives well, and attains a very large size.

It is impossible, in the limited time, which I believe I have already extended to an unreasonable length, to enter upon the insects capable of being introduced for commercial purposes, such as the cochineal and others, more especially the various species of silkworms (an account of which would furnish sufficient material for a lecture by itself), some of which feed upon the foliage of the mulberry tree, some on the castor oil shrub, others on the oleanthus, or Japan varnish tree—and there is one wild species recently sent to Europe from Japan, which feeds upon the varieties of the oak tree. All, therefore, feed upon leaves of trees growing luxuriantly in this colony, and could be readily acclimatised, and the silk produced from them would become a great commercial value.

From the little time left I can only mention respecting plants, that of useful plants, we have had a number introduced, and so acclimatised in a very short time in this colony as to grow most luxuriantly; among others I may mention the bamboo, banana, loquat; the rice-paper plant, the grass-cloth plant, both from China; the rhea, or Assam grass, which produces a fine and valuable fibre, allied, if not identical with the grass-cloth plant of China, and found in a wild state over the tropical Polynesian Islands;—and a number of other valuable trees and plants.

One of our indigenous trees, the gigantic nettle tree of Australia, attaining an elevation of from 50 to 120 feet, can produce an inexhaustible store of fibrous material, useful for various purposes; and from a bag, manufactured by the native blacks, and the specimens of the flax prepared from it, collected by my friend Mr. C. Moore, we may form some idea of its applicability to many kinds of manufacture. The tree grows in great abundance in the Illawarra district, but to

still greater perfection in the Clarence River district, where the supply, Mr. Moore informs me, is almost inexhaustible; many may suppose that large trees, felled to supply a great demand, must be in the space of time destroyed; but when this tree is cut down, and stripped of its fibre, the remaining roots again throw up a large supply of suckers, which, in a very short space of time, will furnish a fresh supply of material, and, by the most common judicious management, the supply may become inexhaustible. The fruit of this tree grows in large clusters, resembling somewhat mulberries in form, and the bunches of fruit are about a foot long, and about the same in breadth, and have a handsome appearance on the tree, being of a beautiful pink colour. Judging from the fruit, which has been collected for the first time by Mr. Charles Moore, I am inclined to consider it will form a new genus of the natural order *Urticaceæ*.

That valuable fruit, the orange, introduced in 1780 and 1790, is now acclimatised in the colony, and the yield of fruit is of great value both for consumption in the colony and for exportation. The addition of new and valuable varieties has also still further increased the value of the fruit. All the other species of the citron tribe, such as citrons, lemons, shaddocks, &c., also thrive well in New South Wales. The annual value of the oranges, and others of the citron tribe, produced in the colony, does not, I believe, amount to a sum less than from £70,000 to £80,000. Such is another of the valuable results of acclimatisation.

By the union of our efforts as a society only can these objects be carried out for acclimatisation. It must be regarded as of national importance, requiring both the aid of the Government and the energy of the people, and by a systematic interchange of specimens from one society to another we shall add to the value of our collections.

One writer has observed that "when we consider the enormous influence produced upon the history of mankind by the sheep, the horse, the dog, and others of our domesticated animals, formerly existing in a state of nature and reclaimed from it by the agency of man, who can deny that results, if not equally great, yet of the utmost importance to the human race, may follow from additions yet to be made to this list. Look at the valuable varieties of poultry which have been introduced into this colony, and the increase of new kinds that have been acclimatised in a very short period of time, as our poultry shows in Sydney can testify; and even when compared to the exhibitions of the same kind in a city like London, which I have recently visited, the collection is highly creditable to so young a colony."

We must bear in mind that acclimatisation is a slow and somewhat tedious process. Sheep have been reared from the wild state for thousands of years, have added untold wealth and comfort to the multitude, yet it has not attained the perfection that may be expected when an increased care and culture shall be bestowed upon it. We must consider also the contingencies that are so liable to happen when a new animal is introduced, and the stock limited in number, constituting one of the greatest obstacles in first attempts at acclimatisation. A great collection was accumulated at Knowsley by the late Earl of Derby, and it took twenty-five years to bring it to a useful state; and then, when by great perseverance and expense the breeding stock of llamas, alpacas, zebras, deer, and antelopes of many species, had been got to a point which in five years more would have made large and permanent results possible, the Earl died. The fiat of dispersion was pronounced, and the whole work crumbled away. This will be a sufficient lesson of the uncertainty of private collections, and the necessity of founding societies based on a general and public interest.

The Australian public must bear in mind that in the year 1807 the importation of wool from Australia into England was 245 bales; in the year 1848, by the exertions of the Macarthurs and others, there were 28,000,000 lbs. At the present time only a few bales of cotton are imported into England; but I expect, before ten years have elapsed, it will have increased to some thousands.

I trust that what I have stated will lead you to reflect on the importance of acclimatisation, especially when, out of thousands of animals the world furnishes to man, we limit our attention to about forty-three; and I am also desirous of impressing upon the minds of all the necessity of preserving from wilful destruction the birds and other innocuous animals of this country. The great Creator "gave man dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth," for his use, benefit, and study; not to lay waste and destroy for mere wantonness.



